

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA19 | Coleshill Junction

Data appendix (AQ-001-019)

Air quality

November 2013

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Department
for Transport

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Appendix AQ-001-019

Environmental topic:	Air quality	AQ
Appendix name:	Data appendix	001
Community forum area:	Coleshill Junction	019

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1 Introduction

1.1.1 The air quality appendices for the Coleshill Junction community forum area (CFA19) comprise:

- discussion of the policy framework (Section 2);
- baseline air quality data (Section 3);
- dust impact evaluation and risk rating (Section 4); and
- air quality assessment – road traffic (Section 5).

1.1.2 Maps referred to throughout the air quality appendix are contained in the Volume 5 air quality map book.

2 Policy framework

- 2.1.1 Warwickshire County Council (WCC) works with the five district and borough councils (North Warwickshire Borough Council, Nuneaton and Bedworth Borough Council, Rugby Borough Council, Stratford-on-Avon District Council and Warwick District Council) within Warwickshire to address transport related air quality issues.
- 2.1.2 The WCC Local Transport Plan¹, covering the period 2011-2026, includes an air quality strategy, which outlines a number of policies aimed at improving air quality across the county. The major themes of the air quality strategy are:
- to improve areas with poor air quality and maintain those areas that currently experience good air quality;
 - to encourage sustainable forms of transport, which reduce reliance on private vehicle use and minimises emissions to air; and
 - to promote awareness of alternative travel choices.
- 2.1.3 Policy AQA2 of the local transport plan air quality strategy, Improving Poor Air Quality through Partnership Working, is concerned with the preparation of air quality action plans (AQAP) and the implementation of traffic management improvements within air quality management areas (AQMA) and wider initiatives to change travel behaviour to encourage walking, cycling and the greater use of public transport.
- 2.1.4 Policy AQA3 of the local transport plan air quality strategy, Maintaining Areas of Good Air Quality, indicates that the lorry route map for Warwickshire will be reviewed every two to three years. This is potentially relevant to heavy duty vehicle (HDV) movements associated with the construction phase of the Proposed Scheme.
- 2.1.5 Policy AQ5 of the local transport plan air quality strategy, Integration of Air Quality and Transport Planning, states that WCC will provide input to the preparation of district and borough council local development frameworks and to individual planning applications to negotiate appropriate air quality and transport improvements.
- 2.1.6 The local planning authorities for the land within the Coleshill Junction area are North Warwickshire Borough Council (NWBC) and Solihull Metropolitan Borough Council (SMBC). The relevant adopted local plans for the Coleshill Junction area are therefore the North Warwickshire Local Plan 2007² and the Solihull Unitary Development Plan (UDP) 2006³.
- 2.1.7 The saved policies of the NWBC local plan form the adopted policy for the purposes of development management in North Warwickshire. These policies will eventually be superseded by the emerging core strategy; however, until then, they remain a material consideration.
- 2.1.8 Policy ENV9: Air Quality is the most directly relevant policy. The policy is committed to safeguarding and enhancing air quality in the borough. The policy includes

¹ Warwickshire County Council (2010/2011), *Warwickshire Local Transport Plan 2011 – 2026*.

² North Warwickshire Borough Council (2006), *North Warwickshire Local Plan; adopted 2006*.

³ Solihull Metropolitan Borough Council (2006), *Solihull Unitary Development Plan 2006 – Written Statement*.

reference to: not permitting polluting forms of development within or adjacent to AQMAs.

- 2.1.9 Policy ENV11: Neighbour Amenities is a key consideration though not limited to air quality. The policy advises that development will not be permitted where it entails significant loss of amenity for nearby occupiers, including overlooking, loss of privacy, or disturbance due to traffic, offensive smells, noise, light, dust or fumes.
- 2.1.10 Emerging planning policy is provided by NWBC Local Plan Core Strategy –Submission Version, February 2013⁴. The Core Strategy forms part of NWBC emerging local plan and when adopted will replace, in part, the NWBC local plan 2006.
- 2.1.11 The core strategy does not refer directly to air quality. Policy NW19, Infrastructure, states that a key priority for the implementation of the strategy's policies and proposals is the protection and enhancement of the environment and mitigation of the environmental impact of development, past and proposed.
- 2.1.12 The saved policies of the Solihull Unitary Development Plan provide the development management framework guiding planning decision-making and taking in the borough. The plan contains one key policy that directly addresses air quality, and a number of policies that, although not directly relevant, remain important considerations.
- 2.1.13 Policy ENV15, Air Pollution, is the principal policy in relation to air quality. The Policy advises that development that would "contribute to air pollution, either directly through emissions or indirectly through emissions from traffic generated will be permitted only if it would not hinder or significantly harm the achievement of national air quality objectives or any relevant Air Quality Management Plan, and it incorporates appropriate attenuation, mitigation or compensatory measures".⁵
- 2.1.14 SMBC submitted the Solihull Draft Local Plan: Shaping a Sustainable Future to the Secretary of State for examination on 14 September 2012⁶. The hearing sessions for the Examination are due to start during 2013. Once adopted, the local plan will replace the majority of the saved policies of the adopted plan.
- 2.1.15 Policy P14, Amenity, will only permit development that protects and enhances the amenity of existing and proposed occupiers and expects developers to consider the visual and other amenity impacts of their proposals. The policy advises that development that would contribute to air pollution would only be permitted if it would not hinder the achievement of national air quality targets and it would incorporate adequate mitigation measures.

⁴ North Warwickshire Borough Council (2013), *North Warwickshire Core Strategy – Submission Version, February 2013*.

⁵ Solihull Metropolitan Borough Council (2006), *Solihull Unitary Development Plan 2006 – Written Statement*. P77.

⁶ Solihull Metropolitan Borough Council (2012), *Solihull Draft Local Plan – Shaping a Sustainable Future; Local development Framework Submission Document* September 2012.

3 Baseline air quality data

3.1 Existing air quality

Local authority review and assessment information

- 3.1.1 Under Part IV of the Environment Act 1995, all local authorities are responsible for local air quality management (LAQM). Under the LAQM regime, a local authority is required to undertake regular review and assessment of local air quality, the findings of which are reviewed by the Department for Environment, Food and Rural Affairs (Defra) prior to publication.
- 3.1.2 If an area is identified as being unlikely to achieve an air quality standard and there are sensitive receptors to be exposed over the relevant exposure period, then the local authority is required to designate an AQMA and develop an AQAP to improve local air quality.
- 3.1.3 There are no AQMAs within the NWBC and SMBC administrative areas.

Local air quality monitoring data

- 3.1.4 Monitoring sites within the Coleshill Junction area that are considered relevant for this assessment are shown in Volume 5: Map AQ-01-019. The following sections provide a summary of the recorded pollutant concentrations at these sites.
- 3.1.5 The pollutant concentrations can be compared to the air quality standards:
- $40\mu\text{g}/\text{m}^3$ as an annual mean for NO_2 and PM_{10} ;
 - $200\mu\text{g}/\text{m}^3$ one-hour mean for NO_2 not to be exceeded more than 18 times a year (equivalent to the 99.8th percentile of the one-hour mean);
 - $50\mu\text{g}/\text{m}^3$ 24-hour mean for PM_{10} not to be exceeded more than 35 times a year (equivalent to the 90.4th percentile of the 24-hour mean); and
 - $25\mu\text{g}/\text{m}^3$ as an annual mean for $\text{PM}_{2.5}$.

Continuous monitoring

- 3.1.6 This section summarises the results from the continuous monitoring sites that are considered relevant for the assessment of air quality in the Coleshill Junction area.
- 3.1.7 There is one continuous air quality monitoring station within Coleshill Junction area which was operational until 2012. This was a roadside site located at the Highways Agency and Warwickshire maintenance depot on Coleshill Heath Road, 580m to the east of the Proposed Scheme. The monitoring site measured NO_2 only. Annual mean data for NO_2 are presented in Table 1. Hourly mean data for NO_2 are presented in Table 2.

Table 1: Annual mean pollutant concentrations recorded at continuous monitoring stations^{7 8}

Pollutant	Annual mean concentrations (µg/m ³)				
	2008	2009	2010	2011	2012
NWBC – Highways Agency and Warwickshire maintenance depot (419890, 287100)					
NO ₂	47	43	38	39	Closed

Table 2: Number of hours when hourly average NO₂ concentrations exceed 200µg/m³ at continuous monitoring sites^{7 9}

Site	Number of exceedances of hourly mean NO ₂ standard				
	2008	2009	2010	2011	2012
NWBC – Highways Agency and Warwickshire maintenance depot	0	1	6	1	Closed

3.1.8 In 2008 and 2009 the annual mean NO₂ concentration was above the air quality standard. In 2010 and 2011 however, the annual mean NO₂ concentration was below the air quality standard, indicating a downward trend in concentrations over the 2008 to 2011 period. The hourly mean air quality standard was met in all years. There is no clear increasing or decreasing trend in the number of exceedances of the hourly mean air quality standard over the 2008-2011 period.

3.1.9 The monitoring site is in the immediate vicinity of the Proposed Scheme and therefore is considered to be representative of air quality at isolated properties which lie close to the motorways; however, concentrations at other properties which lie further away from both the Proposed Scheme and the motorways are expected to meet the relevant air quality standards.

3.1.10 NO₂ is currently the only pollutant that is continuously monitored in NWBC area. The council ceased measuring PM₁₀ in 2008 as it was no longer considered necessary given the low measured concentrations. In 2007, the annual mean PM₁₀ concentration was 16µg/m³ and there were three exceedances of the daily mean standard of 50µg/m³.

3.1.11 Continuous monitoring of pollutants is not undertaken by SMBC and there are no Automatic Urban and Rural Network¹⁰ (AURN) sites, operated in association with Defra, within the Coleshill Junction area.

Diffusion tubes

3.1.12 This section summarises the results from the diffusion tube sites that are considered relevant for the assessment of air quality in the Coleshill Junction area.

3.1.13 NWBC measures annual mean NO₂ concentrations using passive diffusion tubes located across its administrative area. In 2012 there were 17 diffusion tube sites, six of which were located within the Coleshill Junction area: three in the town of Coleshill (approximately 1km east of the centre line of the Proposed Scheme), one in Water

⁷ Source: North Warwickshire Borough Council (2013), *2013 Air Quality Progress Report for North Warwickshire Borough Council*.

⁸ Notes for Table 1: Air quality standard for NO₂ is 40µg/m³ expressed as an annual mean. Closed indicates that monitoring was not undertaken in that year.

⁹ Notes for Table 2: Air quality standard for NO₂ allows for no more than 18 exceedances of 200µg/m³, expressed as an hourly mean. Closed indicates that monitoring was not undertaken in that year.

¹⁰ Department for Environment Food and Rural Affairs; Automatic Urban and Rural Network (AURN); <http://uk-air.defra.gov.uk/networks/network-info?view=aurn>; accessed: July 2013.

Orton (approximately 0.5km north-west of the centre line of the Proposed Scheme), one close to the B4117 (approximately 0.2km west of the centre line of the Proposed Scheme) and one at Coleshill Cottages (within land required for the Proposed Scheme). The annual mean NO₂ concentrations for these sites for the period 2008 to 2012 inclusive are presented in Table 3. Monitoring is also undertaken at two locations around Brickhill Street Farm, 580m east of the centre line of the Proposed Scheme, but there is no relevant exposure at this location as the property is not currently in use. The continuous monitoring site at the Highways Agency and Warwickshire maintenance depot on Coleshill Heath Road has been used to be represent air quality at isolated properties which lie close to the motorways and on this basis monitoring at the two diffusion tube sites at Brickhill Street Farm are not presented.

Table 3: Annual mean NO₂ concentrations recorded at diffusion tube monitoring sites^{7 11}

Site	Coordinates	Annual mean NO ₂ concentrations (µg/m ³)				
		2008	2009	2010	2011	2012
Coleshill Cottages	419000, 291225	30	26	29	24	28
Water Orton	418856, 290943	21	24	28	21	25
Gilson	418856, 290231	34	31	34	29	32
Coventry Road, Coleshill	420027, 287360	36	31	33	28	34
Coleshill School	420113, 287577	28	26	29	23	28
Packington Lane, Coleshill	420323, 287470	28	24	28	22	27

3.1.14 The concentrations recorded by the diffusion tubes are below the relevant annual mean air quality standard, indicating that baseline air quality conditions in the Coleshill Junction area are below the relevant annual mean air quality standard at locations away from motorways. There is no clear increasing or decreasing trend in concentrations over the 2008-2012 period.

3.1.15 Diffusion tube monitoring was undertaken by SMBC at five locations until 2012. No sites are within the Coleshill Junction area.

Background pollutant concentrations

3.1.16 Estimates of background air quality have been obtained from Defra for 2012 and future years (2017 and 2026)¹². These data are estimated for 1km grid squares for nitrogen oxides (NO_x), NO₂, PM₁₀ and PM_{2.5}. NO₂ annual mean concentrations ranged from 31µg/m³ to 39µg/m³ in 2012, PM₁₀ annual mean concentrations ranged from 19µg/m³ to 21µg/m³ in 2012 and PM_{2.5} concentrations ranged from 13µg/m³ to 15µg/m³ in 2012. All average pollutant concentrations are less than the relevant annual mean air quality standards.

3.1.17 The continuous monitoring site described previously is considered to be representative of air quality at isolated properties which lie close to the motorways. The diffusion tube sites are representative of the Coleshill urban area. The background

¹¹ Notes for Table 3: Air quality standard for NO₂ is 40 µg/m³ expressed as an annual mean.

¹² Department for Environment, Food and Rural Affairs; Background Maps; <http://laqm.defra.gov.uk/review-and-assessment/tools/background-maps.html>; accessed: July 2013.

air quality maps produced by the Defra are considered to be an appropriate source of baseline air quality conditions for rural areas along the Proposed Scheme within the Coleshill Junction area.

Local emission sources

- 3.1.18 The main source of emissions of NO_x and PM₁₀ in the Coleshill Junction area is road traffic on the M42, M6 and M6 Toll¹³, which will be crossed by the Proposed Scheme within the Coleshill Junction area. There is a number of permitted part A industrial processes¹⁴. These are a quarrying operation near Cole End, approximately 1.1km east of the centre line of the Proposed Scheme; a landfill operation near Blythe End, approximately 1.3km north-east of the centre line of the Proposed Scheme; and a sludge disposal works adjacent to Lichfield Road, Water Orton, part of which is within the land required for the Proposed Scheme. Due to the nature of the emissions from these Part A Processes, it is unlikely that these will have an effect on local air quality within the Coleshill Junction area. Contributions to local pollutant concentrations made by these industrial installations are included within background concentrations used in the assessment.

3.2 Receptors

Human

- 3.2.1 Human receptors which are considered to be susceptible to changes in air quality due to construction or operation of the proposed scheme have been identified.

Construction phase

- 3.2.2 Human receptors that could potentially be affected by the construction phase of the Proposed Scheme are shown in Volume 5: Map AQ-02-019-01 and Map AQ-02-019-02, for receptors relevant to the construction dust assessment and Volume 5: Map AQ-01-019 for receptors relevant to the construction traffic emissions assessment. These include:

- new cottages on the B4114 Birmingham Road, Coleshill;
- properties on Gilson Drive, Coleshill;
- properties around on Gilson Road, west of Coleshill;
- properties on Gilson Road in Gilson;
- properties on the A446 Lichfield Road, Coleshill;
- properties on the B4117 Watton Lane, Water Orton; and
- properties on Attleboro Lane, Water Orton.

¹³ North Warwickshire Borough Council (2013), *2013 Air Quality Progress Report for North Warwickshire Borough Council*.

¹⁴ Identified from Environment Agency; What's in your backyard website; <http://www.environment-agency.gov.uk/default.aspx>; accessed July 2013. A Part A process is an industrial operation requiring a permit to operate from the Environment Agency under the Environmental Permitting regime, and as such is considered a significant source of pollution.

Operational phase

3.2.3 Human receptors that could potentially be affected by the operation of the Proposed Scheme are shown in Volume 5: Map AQ-01-019:

- properties on Gilson Road in Gilson; and
- properties on Attleboro Lane, Water Orton.

Ecological

Construction phase

3.2.4 No statutory designated ecological receptors that could potentially be affected by the construction of the Proposed Scheme have been identified within the Coleshill Junction area. There are four local wildlife sites (LWS) within the Coleshill Junction area that could potentially be affected by changes in air quality as a result of the dust-generating construction activities associated with the Proposed Scheme as a result construction of the Proposed Scheme. These are Coleshill Hall Farm LWS, south-east of Coleshill Hall Farm and the B₄₁₁₄ Birmingham Road; Wheeley Moor Farm Meadows LWS, south-west of Coleshill Hall Farm and the B₄₁₁₄ Birmingham Road; Coleshill Park Belt LWS, north and west of Coleshill Manor Office Campus between the M6 and the M₄₂, and Coleshill Sewage Works Grassland LWS, between the M₄₂ and the sewage works adjacent to the A₄₄₆ Lichfield Road, Water Orton.

Operational phase

3.2.5 No ecological receptors with a statutory designation or non-statutory designation that could potentially be affected by the operation of the Proposed Scheme have been identified within the Coleshill Junction area.

4 Dust impact evaluation and risk rating

- 4.1.1 The following tables provide details of the assessment of construction impacts following the Institute of Air Quality Management (IAQM) guidance¹⁵. Where considered useful to identify receptors and their relationship to the construction activity a specific figure is provided.
- 4.1.2 The construction activities considered were demolition; construction of the Streethay construction sidings; the construction of new structures; earthworks, including the movement of materials on the haul road along the line of the Proposed Scheme; and dust and mud deposited onto public highways from vehicles travelling to and from construction areas (referred to as trackout in the IAQM guidance).

Table 4: Evaluation and risk rating of construction activities

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
New Cottages, B4114, Birmingham Road, Coleshill (Map-AQ-02-019-01 Figure 19.1)						
Demolition	100m-200m	Large	Medium	Low	Negligible	Properties more than 20m from demolition Total volume of demolition greater than 50,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of demolition expected to be more than 12 months
Earthworks	20m-50m	Large	High	Low	Negligible	Properties more than 20m from earthworks and haul road Total area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months

¹⁵ IAQM (2012), *Guidance on the Assessment of the Impacts of Construction on Air Quality and the Determination of their Significance*.

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Construction	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM10 concentrations less than 75% of air quality standard Duration of construction expected to be more than 12 months
Trackout	Less than 20m	Large	High	High	Slight adverse	Properties 19m from trackout route More than 100 HDV trips per day Baseline PM10 concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties on Gilson Drive, Coleshill (Map-AQ-02-019-01 Figure 19.2)						
Demolition	200m-350m	Large	Low	Low	Negligible	Properties more than 20m from demolition Total volume of demolition greater than 50,000m ³ Baseline PM10 concentrations less than 75% of air quality standard Duration of demolition expected to be more than 12 months
Earthworks	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from earthworks and more than 100m from haul road Total area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM10 concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Construction	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12 months
Trackout	20m-50m	Medium	Medium	Low	Negligible	Properties more than 20m from trackout route 25-100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties along Gilson Road, west of Coleshill (Map-AQ-02-019-01 Figure 19.3)						
Demolition	n/a	n/a	n/a	n/a	n/a	No demolition within 350m
Earthworks	20m-50m	Large	High	Low	Negligible	Properties more than 20m from earthworks and more than 100m from haul road Total area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months
Construction	20m-50m	Large	High	Low	Negligible	Properties more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12months

Appendix AQ-001-019 | Dust impact evaluation and risk rating

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Trackout	Less than 20m	Large	High	High	Slight adverse	Property 18m from trackout route Over 100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties on Gilson Road in Gilson (Map-AQ-02-019-01 Figure 19.4)						
Demolition	n/a	n/a	n/a	n/a	n/a	No demolition within 350m
Earthworks	Less than 20m	Large	High	High	Slight adverse	Properties 17m from earthworks. Properties over 100m from haul road Total area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months
Construction	Less than 20m	Large	High	High	Slight adverse	Properties 17m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12 months
Trackout	Less than 20m	Large	High	High	Slight adverse	Property 8m from trackout route Over 100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties on Chattle Hill, off the A446 Lichfield Road, Coleshill (Map-AQ-02-019-02 Figure 19.5)						
Demolition	n/a	n/a	n/a	n/a	n/a	No properties within 350m of demolition

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Earthworks	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from earthworks and more than 100m from haul road Total site area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months
Construction	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12 months
Trackout	20m-50m	Large	Medium	Low	Negligible	Properties more than 20m from trackout route More than 100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties on B4117 Watton Lane, Water Orton (Map-AQ-02-019-02 Figure 19.6)						
Demolition	n/a	n/a	n/a	n/a	n/a	No properties within 350m of demolition
Earthworks	200m-350m	Large	Low	Low	Negligible	Properties more than 200m from earthworks and haul road Total site area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected to be more than 12 months

Appendix AQ-001-019 | Dust impact evaluation and risk rating

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Construction	200m-350m	Large	Low	Low	Negligible	Properties more than 200m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12 months
Trackout	Less than 20m	Medium	Medium	High	Negligible	Properties 18m from trackout route 25-100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Properties on Attleboro Lane, Water Orton (Map-AQ-02-019-02 Figure 19.7)						
Demolition	20m-100m	Large	High	Low	Negligible	Properties more than 20m away from demolition Total volume of demolition 50,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of demolition expected more than 12 months
Earthworks	Less than 20m	Large	High	High	Slight adverse	Properties 14m from earthworks but more than 50m from haul road Total area of earthworks greater than 10,000m ² More than 10 heavy earth moving vehicles on haul road per day Duration of earthworks expected to be more than 12 months Baseline PM ₁₀ concentrations less than 75% of air quality standard

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Construction	50m-100m	Large	Medium	Low	Negligible	Properties more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected to be more than 12months
Trackout	n/a	n/a	n/a	n/a	n/a	No trackout route within 100m
Coleshill Hall Farm LWS						
Demolition	Less than 20m	Large	Medium	Medium	Negligible	Locally important ecological site Ecological receptor more than 20m from demolition Total volume of demolition 50,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of demolition expected more than 12 months
Earthworks	Less than 20m	Large	Medium	Medium	Negligible	Locally important ecological site Ecological receptor less than 20m from earthworks and haul road More than 10 heavy earth moving vehicles on haul road per day Total site area of earthworks greater than 10,000m ² Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of earthworks expected more than 12 months

Appendix AQ-001-019 | Dust impact evaluation and risk rating

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Construction	Less than 20m	Large	Medium	Medium	Negligible	Locally important ecological site Ecological receptor more than 20m from construction Total volume of construction greater than 100,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of construction expected more than 12months
Trackout	Less than 20m	Large	Medium	Medium	Negligible	Locally important ecological site Ecological receptor less than 20m from trackout route More than 100 HDV trips per day Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of trackout expected to be more than 12 months
Wheeley Moor Farm Meadows LWS						
Demolition	40m-100m	Large	Low	Medium	Negligible	Locally important ecological site Ecological receptor more than 20m from demolition Total volume of demolition 50,000m ³ Baseline PM ₁₀ concentrations less than 75% of air quality standard Duration of demolition expected more than 12 months
Earthworks	n/a	n/a	n/a	n/a	n/a	Earthworks and haul road more than 100m from ecological site
Construction	n/a	n/a	n/a	n/a	n/a	Earthworks and haul road more than 100m from ecological site
Trackout	n/a	n/a	n/a	n/a	n/a	No trackout route within 100m
Coleshill Park Belt LWS						
Demolition	n/a	n/a	n/a	n/a	n/a	Demolition more than 100m from ecological site

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Earthworks	Less than 20m	Large	Medium	Medium	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor less than 20m from earthworks and haul road</p> <p>More than 10 heavy earth moving vehicles on haul road per day</p> <p>Total site area of earthworks greater than 10,000m²</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of earthworks expected more than 12months</p>
Construction	Less than 20m	Large	Medium	Medium	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor less than 20m from construction</p> <p>Total volume of construction greater than 100,000m³</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of construction expected more than 12months</p>
Trackout	20m-100m	Large	Medium	Low	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor more than 20m from trackout route</p> <p>More than 100 HDV trips per day</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of trackout expected to be more than 12 months</p>
Coleshill Sewage Works Grassland LWS						
Demolition	n/a	n/a	n/a	n/a	n/a	Demolition more than 100m from ecological site

Appendix AQ-001-019 | Dust impact evaluation and risk rating

Activity	Distance to nearest receptor	Dust emission class	Dust risk category	Sensitivity of surrounding area	Magnitude of impact (with CoCP mitigation measures)	Principal justifications
Earthworks	Less than 20m	Large	Medium	Medium	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor less than 20m from earthworks and haul road</p> <p>Total site area of earthworks greater than 10,000m²</p> <p>More than 10 heavy earth moving vehicles on haul road per day</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of earthworks expected more than 12months</p>
Construction	Less than 20m	Large	Medium	Medium	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor less than 20m from construction</p> <p>Total site area of construction greater than 100,000m³</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of construction expected more than 12months</p>
Trackout	Less than 20m	Medium	Medium	Medium	Negligible	<p>Locally important ecological site</p> <p>Ecological receptor less than 20m from trackout route</p> <p>25-100 HDV trips per day</p> <p>Baseline PM10 concentrations less than 75% of air quality standard</p> <p>Duration of trackout expected to be more than 12 months</p>

Table 5: Summary of construction dust impacts and effects

Location	Magnitude of impact (with CoCP mitigation measures)	Effect of dust-generating activities	Additional mitigation
New Cottages, A4114 Birmingham Road, Coleshill	Slight adverse	Not significant	None required
Properties on Gilson Drive, Coleshill	Negligible	Not significant	None required
Properties on Gilson Road, west of Coleshill	Slight adverse	Not significant	None required
Properties on Gilson Road in Gilson	Slight adverse	Not significant	None required
Properties on Chattle Hill, off the A446 Lichfield Road, Coleshill	Negligible	Not significant	None required
Properties on A4117 Watton Lane, Water Orton	Negligible	Not significant	None required
Properties on Attleboro Lane, Water Orton	Slight adverse	Not significant	None required
Coleshill Hall Farm LWS	Negligible	Not significant	None required
Wheeley Moor Farm Meadows LWS	Negligible	Not significant	None required
Coleshill Park Belt LWS	Negligible	Not significant	None required
Coleshill Sewage Works Grassland LWS	Negligible	Not significant	None required

5 Air quality assessment – road traffic

5.1 Overall assessment approach

- 5.1.1 The air quality assessment for road related emissions has used three different approaches based on the scale of changes in traffic and road alignment. Where the Design Manual for Roads and Bridges¹⁶ (DMRB) thresholds detailed in the SMR (Volume 5 Appendix CT-001-000/1) will not be exceeded, any additional assessment is not required as the air quality impacts will be minimal. If these thresholds are breached, then an assessment has been carried out.
- 5.1.2 If it is considered unlikely that air quality standards will be exceeded and the road configuration is a simple one, then the DMRB screening method has been used to predict changes in air quality. Where there will be a risk of standards being exceeded, where the road layout is considered to be complex or where the use of the DMRB screening method has indicated that there will be a potential exceedance of air quality standards, then the atmospheric dispersion model ADMS-Roads has been used for the assessment. Professional judgment has been used to select the appropriate tool for each area.
- 5.1.3 In this study area the DMRB screening method was considered to be a suitable tool for the assessment, as baseline air quality will be below air quality standards, there is a simple road layout and there are limited numbers of receptors close to roads affected during construction and operation of the Proposed Scheme.

5.2 Construction traffic model

- 5.2.1 Construction traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. The construction scenario used traffic data from the year of maximum intensity of construction (2021) but assumed this would occur in the first year of construction (2017).
- 5.2.2 Screening using the DMRB traffic and road alignment change criteria was undertaken to determine locations requiring assessment. Two locations within the Coleshill Junction area met the criteria for assessment of change in traffic emissions during the construction phase. These locations are the B4114 Birmingham Road, Coleshill; and the A446 Lichfield Road, Coleshill. At both of these locations, the increase in construction traffic was sufficient to require an assessment of changes in concentrations at receptors around these roads. No locations were identified as requiring assessment due to construction traffic movements on the haul road.

Receptors assessed

- 5.2.3 For locations where DMRB traffic and road alignment change criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for quantitative assessment. These included locations representative of highest concentrations along the roads, including closest to

¹⁶ Highways Agency (2007), *The Design Manual for Roads and Bridges (Volume 11, Section 3, Part 1 Air Quality HA207/07)*.

junctions or to the road itself. Receptors assessed are listed in Table 6 and shown in Volume 5: Map AQ-01-019¹⁷.

Table 6: Modelled receptors (construction phase)

Receptor	Description/Location	Ordnance Survey coordinates
19-1	3 New Cottages, Birmingham Road, Coleshill	419210,288313
19-2	2 New Cottages, Birmingham Road, Coleshill	419215,288318
19-3	1 New Cottages, Birmingham Road, Coleshill	419219,288327
19-4	6 Gorsey Way, Coleshill (Chattle Hill, off the A446 Lichfield Road)	419222,290802

Background concentrations

5.2.4 The background concentrations used in the assessment are shown in Table 7 taken from the Defra Maps.

Table 7: Background 2017 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m ³)		
	NOx	NO ₂	PM ₁₀
19-1(3 New Cottages)	40.5	26.1	18.3
19-2(2 New Cottages)	40.5	26.1	18.3
19-3(1 New Cottages)	40.5	26.1	18.3
19-4(6 Gorsey Way)	41.0	25.7	17.9

DMRB model results

5.2.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the Environmental Protection UK (EPUK) methodology¹⁸.

Table 8: Summary of DMRB annual mean NO₂ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
19-1 (3 New Cottages)	37.9	30.5	33.8	3.3	Medium increase	Slight adverse
19-2 (2 New Cottages)	37.9	30.3	33.4	3.1	Medium increase	Slight adverse
19-3 (1 New Cottages)	37.9	30.5	33.8	3.3	Medium increase	Slight adverse
19-4 (6 Gorsey Way)	35.6	29.5	31.4	1.9	Small increase	Negligible

¹⁷ The receptor on Lanchester Way, Castle Bromwich shown in Map AQ-01-019 just within the boundary of the Coleshill Junction area in presented in Volume 5: Appendix AQ-001-025

¹⁸ Environmental Protection UK (EPUK) (2010), *Development Control: Planning for Air Quality*.

Table 9: Summary of DMRB annual mean PM₁₀ results (construction phase)

Receptor	Concentrations (µg/m ³)			Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2012 baseline	2017 without Proposed Scheme	2017 with Proposed Scheme			
19-1 (3 New Cottages)	20.5	19.1	19.4	0.3	Imperceptible	Negligible
19-2 (2 New Cottages)	20.5	19.1	19.4	0.3	Imperceptible	Negligible
19-3 (1 New Cottages)	20.5	19.1	19.4	0.3	Imperceptible	Negligible
19-4 (6 Gorsey Way)	19.9	18.5	18.7	0.2	Imperceptible	Negligible

- 5.2.6 Annual mean NO₂ and PM₁₀ concentrations will be below the air quality standards both with and without the Proposed Scheme for the construction phase. The hourly mean NO₂ air quality standard will also be met as annual mean NO₂ concentrations will be well below 60µg/m³. In addition the daily mean PM₁₀ air quality standard will also be met. It is not possible to model PM_{2.5} using the DMRB screening model, but given the PM₁₀ concentrations, the annual mean PM_{2.5} concentrations will be below the air quality standard.
- 5.2.7 Changes in modelled concentrations with and without the Proposed Scheme have been calculated to determine the impact to local air quality. For NO₂ there will be a medium increase in concentrations at New Cottages and a small increase at Gorsey Way, Chattle Hill. This is due to increases in traffic on the B₄₁₁₄ Birmingham Road and A₄₄₆ Lichfield Road as a result of construction traffic movements. The change in PM₁₀ concentrations is imperceptible.
- 5.2.8 The magnitude of impact will be slight adverse for NO₂ at New Cottages on the B₄₁₁₄ Birmingham Road due to the medium increase in concentrations combined with the concentrations being below air quality standards. At Chattle Hill, of the A₄₄₆ Lichfield Road the magnitude of impact will be negligible as concentrations are well below air quality standards. For PM₁₀ the magnitude of impact will be negligible for all receptors assessed as concentrations are well below air quality standards.
- 5.2.9 In certain instances additional qualitative assessment has been undertaken. This was the case for the A₄₄₆ between A₄₁₁₄ Birmingham Road and Gilson Road, which was identified as meeting the criteria for assessment due to an increase in construction traffic. The qualitative assessment concluded that the magnitude of impact for NO₂ is expected to be slight adverse at receptors along the A₄₄₆ Lichfield Road. For PM₁₀ the magnitude of impact is expected to be negligible. The expected magnitude of impact has been determined on the basis of the magnitude of construction traffic increases, the baseline air quality is below air quality standards, the distance to the receptors from the roads and the existing traffic flows on the construction traffic routes.

Assessment of significance

- 5.2.10 Considering the significance of the air quality impacts according to the criteria set in the EPUK methodology¹⁸, the following points are noted:
- the magnitude of impact is negligible to slight adverse for NO₂ and negligible for PM₁₀ at receptors; and

- pollutant concentrations are below the air quality standards for both NO₂ and PM₁₀ with and without the Proposed Scheme.

5.2.11 On this basis, the effect on air quality due to construction traffic emission will not be significant.

5.3 Operational traffic model

5.3.1 Operational traffic data used in this assessment are detailed in Volume 5: Appendix TR-001-000. The operational scenario used traffic data from the first year of opening of the Proposed Scheme (2026).

5.3.2 Screening using the DMRB traffic and road alignment change criteria was undertaken to determine locations requiring assessment. Two locations within the Coleshill Junction area met the criteria for an assessment of emissions from traffic during the operational stage, following completion of the Proposed Scheme. These locations are the B4117 Gilson Road, in Gilson, due to permanent realignment of the B4117 Gilson Road, and Attleboro Lane, Water Orton, due to permanent realignment of Attleboro Lane.

Receptors assessed

5.3.3 For locations where DMRB traffic and road alignment change criteria for local air quality were met, a number of receptors representative of worst-case exposure locations were selected for quantitative assessment. These included locations representative of highest concentrations along the roads, including closest to junctions or to the road itself. Receptors assessed are listed in Table 10 and shown in Volume 5: Map AQ-01-019.

Table 10: Modelled receptors (operational phase)

Receptor	Description/Location	Ordnance Survey coordinates
19-5	Gilson Lodge, Gilson Road, Coleshill (in Gilson)	418991,290033
19-6	The Cottage, Gilson Road, Coleshill (in Gilson)	419158,290007
19-7	57 Attleboro Lane, Water Orton	417482,290543

Background concentrations

5.3.4 The background concentrations used in the assessment are shown in Table 11 taken from the Defra maps.

Table 11: Background 2026 concentrations at assessed receptors

Receptor (or zone of receptors)	Concentrations (µg/m ³)		
	NO _x	NO ₂	PM ₁₀
19-5 (Gilson Lodge)	31.9	21.2	17.5
19-6 (The Cottage)	32.8	21.4	17.2
19-7 (57 Attleboro Lane)	29.7	19.9	17.5

DMRB model results

- 5.3.5 This section provides the summary of the modelled pollutant concentrations for the assessed receptors. The magnitude of change and impact descriptor are also derived following the Environmental Protection UK (EPUK) methodology¹⁸.

Table 12: Summary of DMRB annual mean NO₂ results (operational phase)

Receptor	Concentrations (µg/m ³)		Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
19-5 (Gilson Lodge)	22.2	22.6	0.4	Small increase	Negligible
19-6 (The Cottage)	22.7	22.1	-0.6	Small decrease	Negligible
19-7 (57 Attleboro Lane)	19.9	19.9	0.0	Imperceptible	Negligible

Table 13: Summary of DMRB annual mean PM₁₀ results (operational phase)

Receptor	Concentrations (µg/m ³)		Change in concentrations (µg/m ³)	Magnitude of change	Impact descriptor
	2026 without Proposed Scheme	2026 with Proposed Scheme			
19-5 (Gilson Lodge)	17.7	17.8	0.1	Imperceptible	Negligible
19-6 (The Cottage)	17.5	17.4	-0.1	Imperceptible	Negligible
19-7 (57 Attleboro Lane)	17.5	17.5	0.0	Imperceptible	Negligible

- 5.3.6 Annual mean NO₂ and PM₁₀ concentrations will be below the air quality standards both with and without the Proposed Scheme for the operation phase. The hourly mean NO₂ air quality standard will also be met as annual mean NO₂ concentrations will be well below 60µg/m³. In addition the daily mean PM₁₀ air quality standard will also be met. It is not possible to model PM_{2.5} using the DMRB screening model, but given the PM₁₀ concentrations, the annual mean PM_{2.5} concentrations will be below the air quality standard.
- 5.3.7 Changes in modelled concentrations with and without the Proposed Scheme have been calculated to determine the impact to local air quality. There is a small increase in NO₂ concentrations at Gilson Lodge due to the realignment of Gilson Road closer to the receptor. There is a small decrease in concentrations at The Cottage which is also on Gilson Road, but at this receptor location the realignment of Gilson Road moves the road further away from the receptor. At Attleboro Lane the change in NO₂ is imperceptible. The change in PM₁₀ concentrations is imperceptible at all receptors.
- 5.3.8 The magnitude of impact will be negligible at all receptors for NO₂ and PM₁₀ as concentrations are below air quality standards.

Assessment of significance

- 5.3.9 Considering the significance of the air quality impacts according to the criteria set in the EPUK methodology¹⁸, the following points are noted:
- the magnitude of impact is negligible for NO₂ and PM₁₀ at all receptors; and
 - pollutant concentrations are well below the air quality standards for both NO₂

and PM₁₀ with and without the Proposed Scheme.

- 5.3.10 Based on the above, the effect on air quality due to operational traffic emissions will not be significant.

6 References

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